

REMARKS

Applicant expresses appreciation to the Examiner for consideration of the subject patent application. This amendment is in response to the Office Action mailed May 5, 2004. Claims 1-31 were rejected. The claims have been amended to address the concerns raised by the Examiner.

Claims 1, 3, 4, 8-28, 31-39 remain in the application. Claims 1-28 were originally presented, while claims 29-31 were added by preliminary amendment. Claims 2, 5-7, 29 and 30 have been canceled without prejudice. New claims 32-39 have been added. Support for new claims 32, 34 and 35 is found in FIGs. 18 and 30a-d, and the specification at page 12, line 25 - page 13, line 2. Support for new claim 33 is clearly found in the original claims. Support for new claims 36 and 37 are found in the specification at page 9, line 26 – page 10, line 6, and FIGs. 14a, 14c, 19b and 20b. Support for claims 38 and 39 is found in the original claims. Claims 1, 3, 11, 21 and 31 have been amended. Claims 13, 15, 19, 20, 23 and 25 have been amended for clarity, not for reasons related to patentability and without narrowing the scope thereof.

Double Patenting

Claims 10 and 29-31 stand provisionally rejected under § 101 (statutory "same invention" type double patenting) as claiming the same invention as that of claims 8 and 27-29 of copending Application No. 10/606,855. Applicant will cancel any claims that claim the same invention upon allowance of the claims. Applicant notes that claim 10 in the present application depends from independent claim 1, which differs significantly from claim 8 of the other application. Namely, claim 8 of the other application does not include the limitation of "at least one indentation, formed in at least one of the trays at a bottom of at least one of the plurality of registration pin holes; a thin membrane, disposed across the registration pin holes between the registration pin holes and the indentation." Therefore, Applicant respectfully submits that claim 10 of the present application is patentably distinct from claim 8 of the copending application and urges the Examiner to withdraw the rejection.

Claim Rejections - 35 U.S.C. § 102

Claims 1-6, 11-15, 18-25, 27 and 28 (including independent claims 1, 11 and 21) were rejected under 35 U.S.C. § 102(b) as being anticipated by Presswood. Applicant respectfully traverses this rejection for the reasons set forth below.

In order to most succinctly explain why the claims presented herein are allowable, Applicant will direct the following remarks primarily to the originally presented independent claims 1, 11 and 21 with the understanding that once an independent claim is allowable, all claims depending therefrom are allowable.

The Presswood reference fails to disclose a thin membrane disposed between a registration pin hole and an indentation at the bottom of the registration pin hole, with a registration pin extending through the registration pin hole and into the indentation.

In contrast, independent claim 1 sets forth:

"at least one indentation, formed in at least one of the trays at a bottom of at least one of the plurality of registration pin holes, and sized to receive a tip of a finger or thumb; a thin membrane, disposed across the registration pin holes between the registration pin holes and the indentation, configured to close off the registration pin holes and resist dental casting material from substantially filling the registration pin holes; and at least one registration pin, disposable in at least one of the plurality of registration pin holes, the thin membrane being breakable by the registration pin inserted into the registration pin hole with the registration pin being extendable through the thin membrane and into the indentation." (emphasis added)

The elements of an indentation and a membrane between the pin hole and the indentation are not taught in the cited reference, and provide the advantage of better performance of the device because the indentation allows the user's thumb or finger into the indentation to press the pin out of the pin hole, and the location of the membrane facilitates molding.

Therefore, Applicant respectfully submits that independent claim 1, and dependent claims 3, 4 and 8-10, are allowable, and urges the Examiner to withdraw the rejection.

In addition, the Presswood reference fails to disclose a method in which die casting material is poured over the registration pins in the pin holes. The Presswood reference clearly teaches to remove the pins from the holes, and apply dental plaster in the tray with the pin holes

exposed. See FIGs. 9 and 10; and col. 4, line 66 through col. 5, line 4. Thus, the dental plaster is between the holes and the pins, and the pins must be inserted through the plaster into the holes.

In contrast, independent claim 11 sets forth:

"forming a prepped model of a prepped tooth by disposing dental casting material over the registration pin on the working tray of the dental articulator while the registration pin remains in the registration pin hole." (emphasis added)

Similarly, independent claim 21 sets forth:

"disposing dental casting material in the prepped side of the impression and on the working tray with the at least one registration pin remaining in the at least one of the plurality of registration pin holes to resist dental casting material from entering the plurality of registration pin holes." (emphasis added)

The element of leaving the registration pin in the pin hole while applying dental casting material is not taught in the cited reference, and provides the advantage of better performance of the device because casting material does not enter the pin hole or interfere with the pin in the pin hole.

Therefore, Applicant respectfully submits that independent claims 11 and 21, and dependent claims 12-20 and 22-28, are allowable, and urges the Examiner to withdraw the rejection.

Claims 29-31 were rejected under 35 U.S.C. § 102(b) as being anticipated by Welan. Claims 29 and 30 have been canceled. Applicant respectfully traverses this rejection with respect to claim 31 for the reasons set forth below.

The Welan reference fails to disclose an open U-shaped tray with an inner circumferential wall that is straight from a top to a bottom. The Welan reference discloses a ridge extending around an inner circumference of the tray to facilitate removal of molds. See FIGs. 1 and 5.

In contrast, independent claim 31 sets forth:

"at least one of the U-shaped trays being open through a middle of the U-shape and having an inner circumferential wall that is straight from a top to a bottom thereof." (emphasis added)

The element of an inner circumferential wall that is straight from a top to a bottom is not taught in the cited reference, and provides the advantage of better performance of the device because the straight wall 1) allows a spatula to be received completely against the inner surface to scrape around the inner circumference to remove excess casting material before it sets, and 2) allows dry grinding of the lingual area of the model with an arbor band directly on the tray so that the model may be ground vertical and straight in a circumferential manner.

Therefore, Applicant respectfully submits that independent claim 31 is allowable, and urges the Examiner to withdraw the rejection.

Claim Rejections - 35 U.S.C. § 103

Claim 10 was rejected under 35 U.S.C. § 103 as being unpatentable over Presswood in view of Garland. Claims 1-6, 9, 11-15, and 18-27 (including independent claims 1, 11 and 21) were rejected under 35 U.S.C. § 103 as being unpatentable over Mogensen in view of Presswood.

Claims 1-8, 11-17, 19-26 and 28 (including independent claims 1, 11 and 21) were rejected under 35 U.S.C. § 103 as being unpatentable over Huffman in view of Presswood. Applicant respectfully traverses these rejections for the reasons set forth below.

In order to most succinctly explain why the claims presented herein are allowable, Applicant will direct the following remarks primarily to the originally presented independent claims 1, 11 and 21 with the understanding that once an independent claim is allowable, all claims depending therefrom are allowable.

Claim 10 depends from claim 1, which recites

"at least one indentation, formed in at least one of the trays at a bottom of at least one of the plurality of registration pin holes; a thin membrane, disposed across the registration pin holes between the registration pin holes and the indentation, configured to close off the registration pin holes and resist dental casting material from substantially filling the registration pin holes; and at least one registration pin, disposable in at least one of the plurality of registration pin holes, the thin membrane being breakable by the registration pin inserted into the registration pin hole with the registration pin being extendable through the thin membrane and into the indentation." (emphasis added)

The Presswood and Garland references, when combined, do not teach or suggest all of the elements of claim 1. Specifically, neither reference teaches or suggests a membrane disposed

between a pin hole and an indentation with a pin extending into the indentation. Therefore, Applicant respectfully submits that claim 10 is allowable for at least its dependence on allowable claim 1, and urges the Examiner to withdraw the rejection

With respect to independent claims 11 and 21, the Presswood reference clearly teaches away from the Mogensen and Huffman references, as well as the present invention. As described above, the Presswood reference clearly teaches to remove the pins from the holes before applying dental plaster in the tray and over the exposed holes, opposite the teaching of the present invention as claimed. Combining the teachings of Presswood to the teachings of Mogensen or Huffman would require the pins of Mogensen or Huffman to be removed and the exposed holes covered with dental plaster as taught by Presswood. Combining only the membrane teaching of Presswood, without the additional teachings of Presswood to remove the pins to apply dental plaster, with Mogensen results in impermissible hindsight reconstruction based on Applicants disclosure.

In contrast, independent claim 11 sets forth:

"forming a prepped model of a prepped tooth by disposing dental casting material over the registration pin on the working tray of the dental articulator while the registration pin remains in the registration pin hole." (emphasis added)

Similarly, independent claim 21 sets forth:

"disposing dental casting material in the prepped side of the impression and on the working tray with the at least one registration pin remaining in the at least one of the plurality of registration pin holes to resist dental casting material from entering the plurality of registration pin holes." (emphasis added)

Therefore, Applicant respectfully submits that independent claims 11 and 21, and dependent claims 12-20 and 22-28, are allowable, and urges the Examiner to withdraw the rejection.

With respect to new claim 34, none of the cited references teach or suggest a pair of pair of posterior stop rods. The pair of stop rods resists the trays from rocking side to side in the case of free-end posterior teeth.

CONCLUSION

In light of the above, Applicant respectfully submits that pending claims 1, 3, 4, 8-28, 31-39 are in condition for allowance. Therefore, Applicant requests that the rejections and objections be withdrawn, and that the claims be allowed and passed to issue. If any impediment to the allowance of these claims remains after entry of this Amendment, the Examiner is strongly encouraged to call Garron M. Hobson at (801) 566-6633 so that such matters may be resolved as expeditiously as possible.

Check no. 20009 is attached in the amount of \$ 70.00 for one additional independent claim, and three additional claims over twenty. Eight claims were added (claim 32-39), including three independent claims (claims 33 and 34), while six claims were canceled (claims 2, 5-7, 29 and 30), including one independent claim (claim 29).

The Commissioner is hereby authorized to charge any additional fee or to credit any overpayment in connection with this Amendment to Deposit Account No. 20-0100.

DATED this 5th day of August, 2004.

Respectfully submitted,



Garron M. Hobson
Registration No. 41,073

THORPE NORTH & WESTERN, LLP
Customer No. 20,551
P.O. Box 1219
Sandy, Utah 84091-1219
Telephone: (801) 566-6633

Amendments to Specification – Marked-up version to show changes

Changes to the paragraph beginning on page 1, line 16, are as follows:

One method of making a dental model is referred to as the “Double Pour Method” or “~~dry pinning technique~~ pinindex method.” In this method, ~~the model is poured, allowed to harden, separated and trimmed~~ once the model is poured and allowed time to dry, it is separated and trimmed; then holes are placed in the lower surface of the cast followed by inserting the pin with glue and placing the cast into second-pour stone base. The disadvantages of this process include: time consuming, troublesome dowel pin setup, and ~~multiple~~ the requirement for two pours of casting material to create a base and a die. Moreover, this method often involves guesswork, since this method requires the technician to hand occlude two separate casts manually to set the bite. ~~As a result, it is not always possible to relate the mandibular and maxillary casts with one another in such a way as to reproduce an accurate three-dimensional model showing the bites as they were provided by the dentist at the time the negative impression was made.~~ This guesswork will occasionally result in an inaccurate reproduction of the occlusal relationship of the mandibular and maxillary casts. This inaccurate reproduction will not match the original bites provided by the dentist at the time the negative impression was taken. An example of this method can be found in U.S. Pat. 4,734,033. This method can use a separate hinge that is separately attached to the stone bases or models. The hinge can include an adjustable ball-and-socket type connection that is rigidly fixed after the stone bases or models are aligned.

Changes to the paragraph beginning on page 1, line 29, are as follows:

Another method is referred to as the “Single Pour Method” or “~~wet pinning technique~~ method.” In this method, a plastic tray support member replaces the stone base mentioned above, so the second pour stage is eliminated. As a result, the whole process of making a dental model can be considerably shortened. Moreover, it is possible to mount the case without separating the upper and lower cast from the impression so that the case is mounted with the bite exactly as the impression is provided by the dentist. This “Single Pour Method” or “wet pinning technique” can include two types. The first type is the “open cavity tray type” that 1) can stabilize the prosthesis element being worked on, without shifting, or prevent movement of the prosthesis dies

with the help of a notched or arcuate cavity wall which is relatively high; and 2) can eliminate the additional labor of registration pin hole drilling and the pindexing process. The disadvantages of this process include: 1) it can be difficult to control the dies over the entire process of die preparation, wax up, metal finish and porcelain build-up because there is no pin attached at the bottom of the prosthesis dies to hold to work with; 2) initial removal of the entire die from the tray can be difficult because the tray has comparatively high and notched walls necessitating the use of an extra accessory, like a special releasing device, a stand, a mallet etc., and part of the cast can break while being released from the tray; and 3) the initial stage of the wet porcelain build up can be broken because the dies can be seated firmly by a rail or spine that snap fits or clicks into the tray. Examples of such methods can be found in U.S. Patents 5,306,145 and 6,099,305.

Changes to the paragraph beginning on page 3, line 10, are as follows:

The invention provides a dental articulator system to duplicate at least a portion of a patient's mouth for use in producing a dental prosthesis. The device includes a pair of trays pivotally coupled together and pivoting with respect to one another between closed and open configurations. In the closed configuration, the trays are opposingly spaced-apart from one another. In the open configuration, the trays are pivoted away from one another. A plurality of registration pin holes are formed in at least one of the trays. A thin membrane is disposed across a registration pin hole to close off the registration pin hole and resist dental casting material from substantially filling the registration pin hole. Resisting casting material in the pin holes makes the removal of dies easy and clean, and eliminates the initial die breakage off the tray. The absence of the tiny debris of casting material from the initial breakage, and from subsequently repeated engagement and disengagement of the prosthesis dies to the tray, keeps the die receiving surface of the tray clean at all times, and allows positive, accurate, and solid re-registration of the segmented dies onto the tray support member, thus resulting in proper spatial relationship of the segmented dies with respect to the remainder of the dental cast. The thin membrane is breakable by a registration pin inserted into the registration pin hole with the registration pin being extendable through the thin membrane.

Changes to the paragraph beginning on page 12, line 31, are as follows:

While the above has described devices and methods suited for quadrant impression modeling, similar devices and methods can be configured for full-arch impression modeling, as shown in FIGs 30a-c. All the characteristics found in quadrant upper tray 11 and lower tray 12 are reflected in a full-arch tray 90. The full-arch tray 90 can include upper and lower tray support members that are U-shaped to accept impression molds of the patient's entire mouth. The U-shaped tray 90 can be open through a middle of the U-shape, and can have an inner circumferential wall that is flat or straight from a bottom to a top, as shown in FIG. 30a and 30b, to facilitate removal of casting material, such as with a spatula while still wet.